WHAT IS CLAIMED IS:

1. A method comprising:

providing a substrate that transmits light having wavelengths of about 100 nm to about 300 nm;

forming an amorphous isotropic layer on the substrate, which transmits the light at wavelengths in the ranges without substantial attenuation of the light;

patterning the layer; and

removing a portion of the layer from regions of the substrate based on the patterning, such that a diffraction element is formed.

- 2. The method of claim 1, further comprising making the substrate from barium fluoride.
- 3. The method of claim 1, further comprising making the substrate from calcium fluoride.
- 4. The method of claim 1, wherein the forming step comprises forming the layer from silicon dioxide.
- 5. The method of claim 1, wherein the removing step comprises using a material that only removes the portions of the layer.
- 6. The method of claim 1, wherein the substrate acts as a stop to control a thickness of the layer.
- 7. The method of claim 1, wherein the providing step comprises providing the substrate having a thickness of about 1 mm to about 6 mm.

- 8. The method of claim 1, wherein the forming step comprises forming the layer to a thickness of about 100 nm to about 300 nm.
- 9. A diffraction element configured to transmit light having a wavelength in about a nanometer range comprising:
- a substrate allowing relatively low attenuation of the light during transmission; and
- an amorphous isotropic structure pattered on a surface of the substrate.
- 10. The diffraction element of claim 9, wherein the substrate comprises calcium fluoride.
- 11. The diffraction element of claim 9, wherein the substrate comprises barium fluoride.
- 12. The diffraction element of claim 9, wherein the pattern is formed from a silicon dioxide layer.
- 13. The diffraction element of claim 9, wherein the small wavelengths of light are about 100 nm to about 300 nm.
- 14. The diffraction element of claim 9, wherein the light is about one of extreme ultra violet, deep ultra violet, and vacuum ultraviolet range.
- 15. A lithography system configured to pattern substrates with light having a wavelength of about a nanometer range, the lithography system including a diffraction element made of a material that transmits the light, the diffraction element comprising:

a substrate allowing relatively low attenuation of the light during transmission; and

an amorphous isotropic structure pattered on a surface of the substrate.

- 16. The lithography system of claim 15, further comprising an illumination system, wherein the diffraction grating is located in the illumination system.
- 17. A method of forming a diffraction element that transmits light having a wavelength in a nanometer range comprising:

providing a substrate;

forming an amorphous isotropic layer on the substrate;

forming a resist layer on the amorphous isotropic layer;

patterning the resist layer;

removing a portion of the resist layer based on the patterning;

patterning the amorphous isotropic layer based on the previous

patterning step; and

removing a remaining portion of the resist layer.

18. A method of forming a diffraction element that transmits light having a wavelength in a nanometer range comprising:

providing a substrate;

forming a resist layer;

patterning the resist layer;

removing a portion of the resist layer based on the patterning;

forming an amorphous isotropic layer on the patterned resist

layer;

polishing the amorphous isotropic layer; and removing a remaining portion of the resist layer.

- 19. The method of claim 1, wherein the patterning step comprises: forming a resist layer on the layer; exposing a pattern onto the resist layer; removing a portion of the resist layer based on the exposing; removing a portion of the layer based on the pattered resist layer; and removing a remaining portion of the resist layer.
- 20. The method of claim 1, wherein the forming step comprises forming the layer to a thickness substantially equal to the wavelength of the light.
- 21. The method of claim 1, wherein the providing step provides an optical element as the substrate.
- 22. The method of claim 1, wherein the providing step provides a lens as the substrate.
- 23. The method of claim 1, wherein the providing step provides a mirror as the substrate.